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Two new species of *Pittosporum* (*Pittosporaceae*) from Borneo

John B. Sugau

Forest Research Centre, Sepilok
P.O. Box 1407, 90008 Sandakan
Sabah, Malaysia

Summary. Two new species of *Pittosporum, P. silamense* and *P. linearifolium*, from Sabah, are described. Keys to all the species occurring in Borneo are provided. *P. resiniferum* Hemsl. is newly recorded for Sarawak.

The Pittosporaceae are an Old World and a largely Australian family. Only one of nine genera in this family occurs in Borneo. The genus *Pittosporum* was established in 1788 and is typified by *P. tenuifolium* Banks ex Solander from New Zealand. For Borneo, Bakker & van Steenis (1957) described four species (*P. ferrugineum* Ait., *P. ramiflorum* (Zoll. & Mor.) Zoll. ex Miq., *P. resiniferum* Hemsl. and *P. longisepalum* Bakker), and later, Bakker (1962) erroneously added a new record, *P. pentandrum* (Blanco) Merr. (here shown to be a distinct and unnamed species). These five species are found in Sabah. In Sarawak, Ashton (1988) recorded only one species, *P. ferrugineum*, but there is a second species there, *P. resiniferum*, represented by *Chai* S.33994, S.39881 and S.39795.

With a revision of the genus for the Tree Flora of Sabah and Sarawak, two new species have been diagnosed, both so far known only in Sabah. One, *P. silamense* J.B. Sugau, is known from Mt. Silam in the Lahad Datu District, at about 812 m. Vegetatively, it is very close to *P. ferrugineum* but the leaves are persistently rusty hairy on the lower side, with markedly recurved margins when dry. The other, *P. linearifolium* J.B. Sugau, is known from Bukit Ampuan in the Ranau District, at about 1200 m, and was wrongly identified as *P. pentandrum* by Bakker (1962). The species differs from the other *Pittosporum* species chiefly by its very narrowly elliptic to linear leaves, and its specific differences from *P. pentandrum* are discussed at the end of its description in this paper.

Two keys are provided in the present paper to distinguish the two new species from others in Borneo. The first key is based mainly on leaf characters. The second key is based on infructescence and fruit characters; the new taxa are not known by flowering specimens.

Key to *Pittosporum* species in Borneo
(based mainly on vegetative characters)

1a. Leaves very narrowly elliptic to linear, mostly 0.5-1.1 cm wide ..... *P. linearifolium*, sp. nov.

1b. Leaves elliptic, oblanceolate or obovate, typically wider (more than 1.5 cm wide).

2a. Leaves persistently thickly hairy on the lower side, and conspicuously bullate between the nerves on the upper side; margins markedly recurved when dry ..... *P. silamense*, sp. nov.

2b. Leaves never persistently hairy (glabrous or, if hairy, only when very young), and not bullate or only finely so on the upper side; margins not recurved when dry.

3a. Veins on upper leaf surface finely impressed; sepals 6-7 mm long in flower ..... *P. longisepalum*

3b. Veins on upper leaf surface flat, not impressed; sepals shorter, generally less than 4-5 mm long.

4a. Leaves markedly obovate, the apex abruptly cuspidate. Inflorescences borne on bare branches.

5a. Leaf stalks 8-18 mm long. Flower larger, the petals 9-12 mm long. Infructescence stalk not conspicuous or up to 0.5 cm long only. Mature fruits 1.7-2 cm long ..... *P. resiniferum*

5b. Leaf stalks longer, 15-25 mm long. Flower smaller, the petals only 4-7 mm long. Infructescence stalk longer, 1-3 cm long. Mature fruits 1-1.5 cm long ..... *P. ramiflorum*

4b. Leaves elliptic, or if oblanceolate to obovate, then gradually acuminate. Inflorescences borne in the leafy portions of branches ..... *P. ferrugineum*

Key to *Pittosporum* species in Borneo
(based mainly on reproductive characters)

1a. Inflorescences mainly on bare branches.

2a. Petals 4-7 mm long. Infructescence stalk 1-3 cm long. Fruit 1-1.5 cm long ..... *P. ramiflorum*

2b. Petals longer, 9-12 mm long. Infructescence stalk inconspicuous or only to about 0.5 cm long. Fruit 1.7-2 cm long ..... *P. resiniferum*

1b. Inflorescences among leaves on the branches.

3a. Seeds attached to a placenta to halfway to apex of the fruit .... *P. ferrugineum*

3b. Seeds attached to the basal portion of the fruit only.

4a. Ovary glabrous, or at most slightly hairy at the base. Leaves very narrow, 0.5-1.1 cm wide only ..... *P. linearifolium*, sp. nov.

4b. Ovary hairy all over. Leaves broader than 1.5 cm wide, typically much broader.

5a. Seeds up to 11 per fruit. Lower leaf surface persistently rusty hairy ..... *P. silamense*, sp. nov.

5b. Seeds only 1-4 per fruit. Lower leaf surface glabrous .... *P. longisepalum*

The new species

Pittosporum linearifolium *J.B. Sugau* **sp. nov.** *P. pentandro (Blanco) Merr. sed foliis angustissime-ellipticis vel linearibus (0.5-1.1 cm latis), pedunculis brevissimis (minus 1 cm longis), seminibus paucis (2-4 in quoque fructu) differt. Typus: Madani SAN 89542, Sabah, Ranau, Bukit Ampuan (holotypus SAN; isotypus KEP).*

Medium-sized tree, up to 8 m tall. Bark smooth, whitish; inner bark creamy grey; sapwood white to brown. Leaves very narrowly elliptic to linear, 4-7 x 0.5-1.1 cm, apex narrowly acute, base narrowly cuneate, margins slightly recurved when dry, chartaceous, brown to dark brown on both sides, midrib slightly sunken on the upper side but raised on the lower side; secondary veins 5-6 pairs, not very conspicuous; reticulations very fine; glabrous; leaf stalks 1-5 mm long, slender, grooved on the upper side. Inflorescence a simple thyrse. Fruits 1-4 per infructescence, a capsule, subglobose, 0.8-1.1 cm long, notched and mucronate apically, narrowed towards the base, glabrous, rugose;infructescence stalk very short (less than 1 cm long), glabrous. Seeds 2-4 per fruit, attached to a placenta at the base of the fruit only, shiny black.

SPECIMENS EXAMINED - BORNEO. SABAH: Ranau, Bukit Ampuan, *Madani* SAN 89542 (holotype SAN, isotype KEP); *Meijer* SAN 20289 (K).

The species is known only from hill forest at Bukit Ampuan, in the Kinabalu area, at about 1200 m. It appears to be endemic there.

This species was wrongly identified as *P. pentandrum* by Bakker (1962), who had seen only one specimen, *Meijer* SAN 20289. Although it approaches *P. pentandrum* in having a subglabrous ovary, it differs by its very short inflorescence stalks (less than 1 cm long), fewer flowers per inflorescence (1-4, compared to more than 10 in *P. pentandrum*), and fewer seeds (2-4) per fruit. Compared with *P. ferrugineum*, it differs by its subglabrous ovary, very short inflorescence stalk, and fewer seeds attached to the basal part of the fruit. *P. linearifolium* differs from all other *Pittosporum* species in Malesia by its very narrowly elliptic to linear leaves.

Pittosporum silamense J.B. Sugau **sp. nov.** *P. longisepalo Bakker affinis sed pagina inferiore laminae dense persistenterque pilosa, pagina superiore valde bullata, marginibus folii in siccitate recurvatis pedunculis brevissimis, 0.8-1.2 cm longis, multis seminibus (usque 11 in quoque fructu) differt. Typus: Joseph et al. SAN 120894, Sabah, Lahad Datu, Mt. Silam (holotypus SAN).*

Small tree, bole *c.* 5 cm diameter. Bark smooth, brownish; inner bark yellowish; sapwood yellowish. Young parts densely persistently ferrugineous hairy. Leaves generally elliptic, *c.* 5.5-10 x 2.5-4 cm, apex narrowly acute to acuminate, base cuneate, margins markedly recurved when dry, rather thick, midrib sunken on the upper side but raised on the lower side; secondary veins 6-9 pairs, deeply impressed on the upper side; conspicuously bullate between the veins on the upper side; persistently thickly rusty hairy on the lower side; leaf stalks 8-18 mm long, slender, grooved on the upper side. Inflorescence a many-flowered thyrse. Fruit 10-18 per infructescence, a capsule, greenish to blue when unripe, subglobose, 0.8-1.1 cm long, notched and mucronate apically, base narrowed to about 2 mm long, covered with rusty hairs; infructescence stalks very short, 0.8-1.2 cm long, hairy. Seeds up to 11 per fruit, attached on a placenta at the base only, black.

SPECIMENS EXAMINED - BORNEO. SABAH: Lahad Datu, Mt. Silam, *Joseph et al.* SAN 120894 (holotype SAN), *Maikin & Lideh* SAN 67521 (SAN), *George & Patrick* SAN 138314 (SAN).

This species appears to have a very restricted distribution. It is so far known only from hill forest on Mt. Silam, an ultramafic coastal mountain in Sabah, at about 812 m. It is very likely endemic there. A study by Proctor *et al.* (1988) of this mountain stated that none of their identified tree species is endemic to Mt. Silam; the present species was, however, not collected by them.

P. silamense differs from all other *Pittosporum* species by its persistently thick brown hair covering on the lower leaf surface and its coarsely bullate upper leaf surface. Although it is related to *P. longisepalum* in having a hairy ovary, it differs by its very short inflorescence stalks (0.8-1.2 cm long) and more (up to 11) seeds per fruit. Vegetatively, it is close to *P. ferrugineum* in having brown hairs on the leaves but in *P. ferrugineum*, the leaves are hairy only when very young and the hairs fall off when the leaves become mature. Moreover, compared with *P. ferrugineum*, it differs by having more (up to 11) seeds per fruit, and its seeds are attached only to the basal part of the fruit.

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